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Vol. 156, No. 16**Fertilizer: Hiding a toxic pollutant? ●****By J. Raloff**

Perchlorate is hardly a household name. Yet its notoriety is climbing as the presence of this toxic, thyroid-hormone-disrupting salt leads to the closure of drinking-water wells in the western United States.

Until now, waterborne perchlorate (ClO_4^-) has been linked almost exclusively to aerospace activities, since the compound is a major ingredient in rocket fuels. An Environmental Protection Agency study now reports evidence of a far more prosaic and potentially widespread source: garden-variety fertilizers.

Other researchers within EPA and in the fertilizer industry, however, are challenging the new data. More embarrassing, the authors of the new study—scientists at EPA's National Exposure Research Laboratory in Athens, Ga.—told *Science News* that they will have to retract some of their positive findings.

Says Steve C. McCutcheon, who heads the Athens EPA team, "We definitely made a few mistakes" in the first analysis. However, he argues, "we do have irrefutable evidence" of perchlorate in all fertilizers tested.

Chilean nitrate—historically a common ingredient in some fertilizers—has been a known natural source of perchlorate for more than a century. The chemical has even turned up in at least one deposit of potash, a common fertilizer ingredient. Finally, the aerospace industry, which is responsible for cleaning up some of the worst perchlorate water problems so far detected, has recently reported data from two studies finding perchlorate in fertilizer, McCutcheon notes.

Against this backdrop, the Athens scientists stepped in to analyze nine fertilizers, most of them intended for lawns and gardens, using three independent techniques. They also assayed eight fertilizer ingredients using one or two of the techniques. In the just-published Oct. 1 *Environmental Science & Technology* (ES&T), the researchers report finding perchlorate in every sample tested.

This universal contamination should have been the first clue that something might be wrong, argues chemist Edward T. Urbansky of EPA's lab in Cincinnati. He notes that some of the ingredients tested, such as urea, have no mineral sources—and therefore should contain no perchlorate.

Having reviewed its disputed results, the Athens team will soon ask ES&T to "correct" the data for five of the eight fertilizer ingredients, acknowledging that it can no longer detect perchlorate in them. However, McCutcheon emphasizes, these retractions will not affect the results for the fertilizers, which were more fully analyzed.

At EPA's National Center for Environmental Assessment in Research Triangle Park, N.C., "We have real concerns [about the Athens data] that are quantitative and qualitative," notes Annie M. Jarabek. The techniques used to measure perchlorate are still evolving and not yet unambiguous, says Jarabek, who is heading EPA's toxicological risk assessment on the compound. Moreover, she wonders why the Athens team assayed fertilizers that are used by homeowners instead of the brands that farmers use.

Since learning of the Athens data earlier this year, Urbansky has analyzed some 45 fertilizers with what he says is a far more sensitive technique than has previously been used to perchlorate. So far, he finds "no detectable perchlorate" in anything except a few pure sodium nitrates. Presumably, he says, they contain the infamous Chilean nitrate.

These data lead him to suspect "that the Athens group is almost completely wrong" about fertilizer as a major source of perchlorate. McCutcheon instead argues that perchlorate concentrations are

inconsistent in the fertilizers—his lab now witnesses variations—and may trace to seasonal changes in sources of raw materials.

Last month, EPA added perchlorate to its list of contaminants that water utilities must monitor. As the compound's toxicity is better understood, Jarabek says, it might come under federal regulation, perhaps as early as 2003.



References and sources for this article

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Whether common fertilizers are tainted with perchlorate, a toxic salt, remains controversial, despite new EPA tests.

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The U.S. Environmental Protection Agency Office of Ground Water and Drinking Water maintains a Web site about perchlorate at <http://www.epa.gov/OGWDW/ccl/perchlor/perchlo.html>.

The Fertilizer Institute's Web page entitled *Questions and Answers about Perchlorate and Fertilizer* is available at <http://www.tfi.org/perch.htm>.

Further Readings:

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The State of California Department of Health Services' Perchlorate in California Drinking Water Web site is available at <http://www.dhs.cahwnet.gov/ps/ddwem/chemicals/perchl/perchlindex.htm>.

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